


# **Radio Shack®**

## **DICTIONARY**

of

# **ELECTRONICS**

Rudolf F. Graf

**RADIO SHACK**  **A TANDY CORPORATION COMPANY**  
Fort Worth, Texas 76107

## FOURTH EDITION

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## torsion galvanometer

## tower loading

**torsion galvanometer**—A galvanometer in which the force between the fixed and moving systems is measured by the angle through which the supporting head of the moving system must be rotated to return the moving system to zero.

**torsion-string galvanometer**—A sensitive galvanometer in which the moving system is suspended by two parallel fibers that tend to twist around each other.

**total capacitance**—The capacitance between a given conductor and all other conductors in a system when all other conductors are connected together.

**total combined regulation**—The change in output of a regulated power supply arising from simultaneous changes in all of the specified operating conditions, when the direction of such changes is such as to make their effects additive. It may be stated as a percentage of the specified output and/or an absolute value.

**total distortion**—The sum total of all forms of signal distortions.

**total emission**—The magnitude of the current produced when electrons are emitted from a cathode under the influence of a voltage such that all the electrons emitted are drawn away from the cathode.

**total emissivity**—The ratio of radiation emitted by a surface to the radiation emitted by the surface of a black-body under identical conditions. Important conditions which affect emissivity of a material are surface finish, color, temperature, and wavelength of radiation. Emissivity may be expressed for radiation of a single wavelength (monochromatic emissivity), for total radiation of a specified range of wavelengths (total spectral emissivity), or for total radiation of all wavelengths (total emissivity).

**total excursion**—The application of a stimulus, in a controlled manner, over the span of an instrument.

**total harmonic distortion**—1. The ratio of the power at the fundamental frequency measured at the output of the transmission system considered, to the power of all harmonics observed at the output of the system because of its nonlinearity when a single frequency signal of specified power is applied to the input of the system. It is expressed in decibels. 2. The square root of the sum of the squares of the rms harmonic voltages divided by the rms fundamental voltage. Abbreviated thd.

**total internal reflection**—When light passes from one medium to another which is optically less dense (e.g., from glass to air), the ray is bent away from the normal. If the incident ray meets the surface at such an angle that the refracted ray must be bent away at an angle of more than 90°, the light cannot emerge at all, and is totally internally reflected.

**totalizing**—To register a precise total count

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from mechanical, photoelectric, electromagnetic, or electronic inputs or detectors.

**total losses of a ferromagnetic part**—Under stated conditions, the power absorbed and then dissipated as heat when a body of ferromagnetic material is placed in a time-varying magnetic field.

**total losses of a transformer**—The losses represented by the sum of the no-load and load losses.

**total luminous flux**—The total light emitted in all directions by a light source.

**totally enclosed motor**—A motor so enclosed as to prevent the free exchange of air between the inside and the outside of the case, but not sufficiently enclosed to be termed airtight.

**totally unbalanced currents**—See Push-Push Currents.

**total range of an instrument**—Also called the range of an instrument. The region between the limits within which the quantity measured is to be indicated or recorded.

**total regulation**—The arithmetic sum of changes in output of a regulated power supply arising from changes in each of the specified operating conditions (current, voltage, or power) when such changes are applied individually, and in a manner to make their effects additive. It may be stated as a percentage of the specified output and/or absolute value.

**total resistance**—The dc resistance of a (precision) potentiometer between the input terminals with the shaft positioned so as to give a maximum resistance value.

**total spectral emissivity**—See Total Emissivity.

**total telegraph distortion**—Telegraph transmission impairment expressed in terms of time displacement of mark-space and space-mark transitions from their proper positions and given in percent of the shortest perfect pulse called the unit pulse.

**total transition time**—In a circuit, the time interval between the point of 10% input change and the point of 90% output change. It is equal to the sum of the delay time and rise (or fall) time.

**touch call**—See Pushdown Dialing.

**touch control**—A control circuit that actuates a circuit when two metal areas or a pre-selected area are bridged by one's finger or hand.

**touch-tone dialing**—Push-button telephone dialing in which the direct-current pulsing technique of the rotating dial is replaced by a combination of tones to provide the proper automatic switching.

**tourmaline**—A strongly piezoelectric natural or synthetic crystal.

**tower**—A structure usually used when an antenna must be mounted higher than 50 feet.

**tower loading**—The load placed on a tower by its own weight, the weight of the wires and insulators with or without ice covering.

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## CT3 Series 12-24 VDC Touch Sensors

**CT3**

- C2T Technology
- Solid, Vandal Proof Case
- Detects Near Proximity Or Touch
- No Moving Parts
- Replaces Mechanical Switches
- Thru-Hole Mounting
- Custom Engraving

Using a unique C2T Technology the G.R.I. Touch Sensor can sense and respond to the slightest human touch.

Applications include industrial panels, appliance control, access systems, corrections facilities, light switches, elevator buttons etc.

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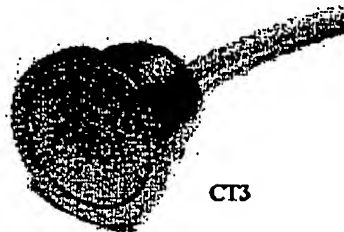
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# TOUCH SENSOR

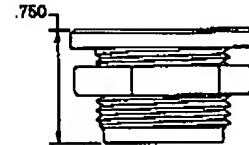
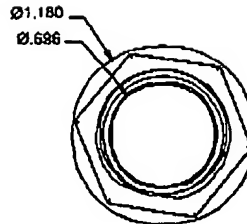
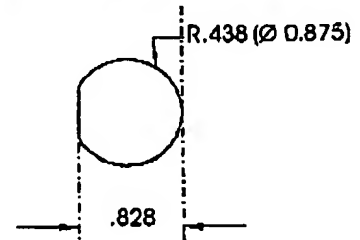


## CT3

- ◆ 1/4 Amp or 2 Amp
- ◆ **Touch ON**
- ◆ **Touch OFF**
- ◆ No Moving Parts
- ◆ Vandal Resistant, Solid
- ◆ Thru-Hole Mounting
- ◆ C<sup>2</sup>T Technology
- ◆ Custom Engraving



CT3



Using a unique C<sup>2</sup>T Technology the G.R.I. Touch Sensor can sense and respond to the slightest human **touch**. The CT3 was developed by G.R.I. to replace mechanical switch applications. The CT3 can be mounted on metallic and non-metallic surfaces. Metal surfaces cannot exceed 1 square foot and cannot be grounded. The CT3 comes in a very cost effective package frequently costing less than the mechanical switch being replaced. Applications include industrial panels, appliance control, access systems, corrections facilities, light switches, elevator buttons, etc. Custom applications are encouraged and welcomed at G.R.I.

### Solid State Output

#### 1/4 Amp

- |       |   |
|-------|---|
| CT3-1 | Normally Open Momentary 12-24VDC Touch Sensor, 250mA          |
| CT3-2 | Normally Closed Momentary 12-24VDC Touch Sensor, 250mA        |
| CT3-3 | Normally Open 12-24VDC Alternate Action Touch Sensor, 250mA   |
| CT3-4 | Normally Closed 12-24VDC Alternate Action Touch Sensor, 250mA |

### Relay Output

#### 2 Amp

- |         |   |
|---------|---|
| CT3-2-1 | NO/NC Contacts 12-24VDC, Momentary Touch Sensor, Relay De-energized, 2 Amp        |
| CT3-2-2 | NO/NC Contacts 12-24VDC, Momentary Touch Sensor, Relay Energized, 2 Amp           |
| CT3-2-3 | NO/NC Contacts 12-24VDC, Alternate Action Touch Sensor, Relay De-energized, 2 Amp |
| CT3-2-4 | NO/NC Contacts 12-24VDC, Alternate Action Touch Sensor, Relay Energized, 2 Amp    |

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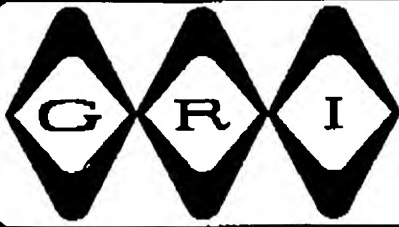
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# TOUCH SENSOR

## CT3 INSTALLATION INSTRUCTIONS:

Drill a 7/8" hole  
Install Nut and tighten finger tight.

Note: If more secure mounting is required see  
Diagram for D-Hole dimensions.

Insert Switch  
Connect Red Wire to 12 to 24VDC  
Connect Black Wire to Power Ground

Caution: Do Not Mount Switch to Grounded Metal Surface

Do Not Hook White or Green Wires to AC Type  
Signal or Source

Test Switch by Arming Zone and Then Touch Switch.

### CT3-X Options

Connect White Wire to Zone (DC + Signal)  
Connect Green Wire to Zone Ground (DC - Signal)

CT3-1 Normally Open: When touched the switch closes;  
when released the switch opens.

CT3-2 Normally Closed: When touched the switch opens;  
when released the switch closes.

CT3-3 Alternate Action: Touch ON, Touch OFF, Normally Off

CT3-4 Alternate Action: Touch OFF, Touch ON, Normally On

### CT3-2-X Options

CT3-2-1 Relay normally de-energized: when touched relay energizes; when released relay de-energizes. White is the relay common, green is Normally Closed, & brown Normally Open.

CT3-2-2 Relay normally energized: when touched relay de-energizes; when released relay energizes. White is the relay common, green is Normally Open, & brown Normally Closed.

CT3-2-3 Alternate Action: Touch energizes, touch de-energizes. White is the relay common, green is Normally Closed, brown Normally Open.

CT3-2-4 Alternate Action: Touch de-energizes, touch energizes. White is the relay common, green is Normally Open, brown Normally Closed.

## SPECIFICATIONS:

Four-wire touch switch, 12-24VDC, ground, + zone, zone common.  
Touch activated by human hand, gloves can be worn, or metal conductor.  
Solid state output to zone connections.  
Low Current Draw.  
Output rated to 1/4 amp or 2 amp, depending on model.  
New, advanced CT technology.

Caution: Do Not Mount On A Grounded Metal Surface!

Input—	Voltage	: 12 to 24VDC maximum	Output—	Resistance	: 1.2 ohm typical, 5 ohms max.
	Current	: 2 mA maximum		Voltage	: 25 volts DC maximum
				CT3-X	: 250 mA continuous
				CT3-2-X	: 2 amp

## WARRANTY:

One year warranty against workmanship, material and factory defects

GEORGERISK INDUSTRIES, INC.  
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